

# Non-Obstetric Surgical Emergencies in Pregnancy; A 5 Year Retrospective Study in The Buea Regional Hospital and Douala Gynaeco-Obstetric and Paediatrics Hospital

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## 1. Abstract

### 1.1. Background

Non-obstetrical surgical emergencies during pregnancy is linked with a higher occurrence of postoperative adverse events, delay diagnosis and misdiagnosis increases the risk of poor maternal and foetal outcome. This study aimed to evaluate the proportion, indications, timing and outcomes of non-obstetric surgical emergencies during pregnancy.

### 1.2. Methods

A 5-year retrospective cross-sectional study was carried out from 1st January 2020 to December 31st 2024 at the Buea Regional Hospital and Douala Gynaeco-Obstetric and Paediatric Hospital. It included all pregnant women admitted for a non-obstetrical surgical emergency during pregnancy. Data were extracted using a validated form and analysed using Statistical package for social sciences version 25.0

### 1.3. Results

The proportion of non-obstetric surgical emergencies was 1.7%. The mean age of the women who underwent such surgeries was 30.15±5.43 years (Range 22 - 41 years 95% CI). Most of the cases were in the Second trimester 58.7% (27/46). Acute appendicitis was the most frequent indication for surgery across all trimester.

### 1.4. Conclusion

The proportion of non-obstetrics surgical emergency was within global estimate performed particularly in the second trimester with appendicitis being the most common indications. They

should be increased collaborations between surgical, obstetric and emergency care teams for timely and coordinated patient management.

## 2. Background to Study

Globally, non-obstetric surgical emergencies, including acute abdomen during pregnancy and traumas [1], are performed in approximately 0.75% to 2.0% of all pregnancies [2]. Non-obstetric surgical emergency in pregnancy is associated with a higher occurrence of postoperative adverse events, such as septicemia, hospital acquired pneumonia, infection of the urinary tract, and in-hospital mortality [3]. Nonetheless, the American College of Obstetricians and Gynaecologists' Committee still concluded that a pregnant woman should never be refused an indicated surgery [4].

The most common indications for surgery in pregnancy are infections such as acute appendicitis and cholecystitis [5], pregnant women may also need acute surgical intervention for ovarian disorders and bowel obstruction, as well as for trauma related indications [6,7]. Various types of disease can occur in pregnant women and require immediate surgical intervention and optimized multidisciplinary management to achieve maximum safety for both mother and child, to avoid teratogenous medication, foetal acidosis and hypoxemia, and adverse pregnancy outcomes such as abortions, stillbirth or premature birth [8,9].

Acute abdomen in pregnancy (AAP) is defined as severe abdominal pain of less than 24 hours duration that may require urgent surgery [10]. It is a challenging situation to diagnose and manage, as it is associated with pain due to the normal anatomi-

cal and physiological changes that occur during pregnancy [11]. AAP has been listed as 5-10% of all emergency department cases, with non-obstetric acute abdomen that requires a surgical intervention represents about 0.5-2%, with more than 8000 needing emergent surgery per year [10,12]. The high prevalence of symptoms such as; nausea, vomiting, and abdominal pain in the general obstetric population, and a general hesitancy to operate unreasonably [13].

Non-obstetric surgical emergencies in pregnancy increases the risk of poor birth outcomes, such as abortions, stillbirth, premature delivery, low birth weight, and a low Apgar score [11]. Surgical disease and surgery predispose both pregnant woman and fetuses to several complications, such as surgical and oxidative stress, anaesthetics, analgesics, and postoperative pain, which may also affect the course of pregnancy [11].

The time of the operation may affect the risk of adverse birth outcomes, as surgeries performed in the first and third trimesters are associated with a higher risk of premature delivery, low weight under 1750 g, and low Apgar scores [6].

Non-obstetric surgical emergencies during pregnancy present a significant challenge in both diagnosis and management, primarily due to the physiological changes that occur during pregnancy [3]. These emergencies are often misdiagnosed or identified only after complications have developed. Furthermore, the prevalence of these acute surgical conditions and the specific trimester in which they most commonly occur remain poorly documented, particularly in resource-limited settings such as Cameroon [10]. The surgical management of acute surgical emergencies during pregnancy presents considerable challenges. These difficulties arise from the physiological changes of pregnancy and the presence of the uterus in the abdominal cavity, particularly during the second and third trimesters [14]. During this time, many abdominal organs are displaced from their usual anatomical positions, complicating surgical interventions.

Additionally, a larger proportion of existing scientific text on this topic primarily focuses on diagnosis, surgical management, anaesthesia of choice and immediate maternal complications, leaving other aspects less explored [10]. With only few studies that have reported information about types of obstetric surgical emergencies, timing of occurrence of these emergencies during pregnancy and obstetric and foetal outcomes in women having emergency non obstetric surgery during pregnancy [7].

Non-obstetric surgical emergencies during pregnancy pose unique diagnostic and management challenges, primarily due to physiological and anatomical changes in pregnancy [2]. Conditions such as appendicitis, cholecystitis, and trauma, if misdiagnosed or managed late, can lead to significant maternal and foetal morbidity and mortality [10]. Despite their clinical significance, there is limited data on the proportion, types of surgical pathologies and trimester of pregnancy which they mostly occur in pregnant women in Cameroon [10]. A 5-year retrospective analysis in referral hospitals offers an opportunity to fill this gap, providing valuable insights to guide evidence-based interven-

tions, optimize maternal and foetal outcomes, and inform health-care policies and resource allocation particularly in resource constrained healthcare systems.

### **3. Methods**

#### **3.1. Study Design**

This study was 5-years hospital-based retrospective-cross sectional study from January 1st, 2020 to December 31st 2024 at two selected referral Hospital of Cameroon. The design was selected quick, cost-effective, and good for measuring population prevalence and generating hypotheses by analysing existing data at a single point in time.

#### **3.2. Study Site**

This study was conducted in the Buea Regional Hospital (BRH) and Douala Gynaeco-Obstetric and Paediatrics Hospital (HGOPED). The DGOPED is a prominent healthcare institution located in Douala, Littoral Region, Cameroon, specifically dedicated to maternal and child health. Established on January 23, 2014. The hospital is strategically situated in the Douala 3rd municipality, making it accessible for patients in the region. DGOPED operates as a first-category hospital, meaning it offers a wide range of medical services beyond its primary focus on gynaecology, obstetrics, and paediatrics. The hospital's mission includes delivering quality healthcare in accordance with international standards, training healthcare professionals, and conducting research in maternal and child health. Additionally, DGOPED is equipped to handle emergency cases, particularly those involving trauma victims, given its location and the needs of the community. This study was conducted at the Buea Regional Hospital in the southwest region of Cameroon. Buea is a city with a rich cultural history, and is the regional capital. The Buea Regional Hospital is a secondary level hospital supported by various specialized units, including medical Unit, private Unit, VIP Unit, surgical unit, maternity, paediatrics, ICU, and emergency units. It functions as one of the primary referral centres in the region, and accepts patients with a variety of acute and chronic illnesses. The hospital itself is located at the base of Mount Cameroon and is strategically positioned to serve both urban and rural populations, catering to a diverse patient demographic. It has a capacity of around 300 beds to offer inpatient and outpatient services, including complex diagnostic and therapeutic care.

#### **3.3. Study Population and Sampling**

This included medical records of pregnant women who were admitted for a non-obstetric surgical emergency at the various hospital during the study period and who ended up with a surgical intervention. The study included all files of pregnant women who were admitted for a non-obstetric surgical emergency. We excluded from the study files of patients with incomplete relevant clinical data such as indication for surgery and trimester of pregnancy and gynaecological emergencies. A non-probability sampling technique was used, employing a consecutive sampling method where all files that meet the inclusion criteria were

included in the sample.

### 3.4. Data Collection tool and Procedure

A data extraction form was used to extract data from patients' records. This form included 6 sections; (i) sociodemographic characteristics: which included information on Age, occupation, marital status, level of education, income level and residence (urban vs rural), (ii) Obstetric Information (gravidity, parity gestational age), (iii) Medical and Past Surgical (previous surgery, HIV status, other comorbidities), (iv) type of surgery, (v) indication for surgery and (vi) trimester in which this surgery occurred. The validity of the content for the tool was examined by the research team, who reviewed the content of the tool for clarity, relevance, applicability, and ease of implementation. A pilot study was conducted at a tertiary hospital not included in the study. The pilot included with records of 10 patients to assess the feasibility of the extraction form to provide relevant data. After retrieving eligible files, incomplete data were excluded. Data were extracted from the medical records of the patient who meet the inclusion criteria weekly.

### 3.5. Data Analysis

All data collected were checked for completeness, cleaned and entered into a Microsoft excel sheet weekly. To maintain patients' privacy, codes and serial number were assigned entry The

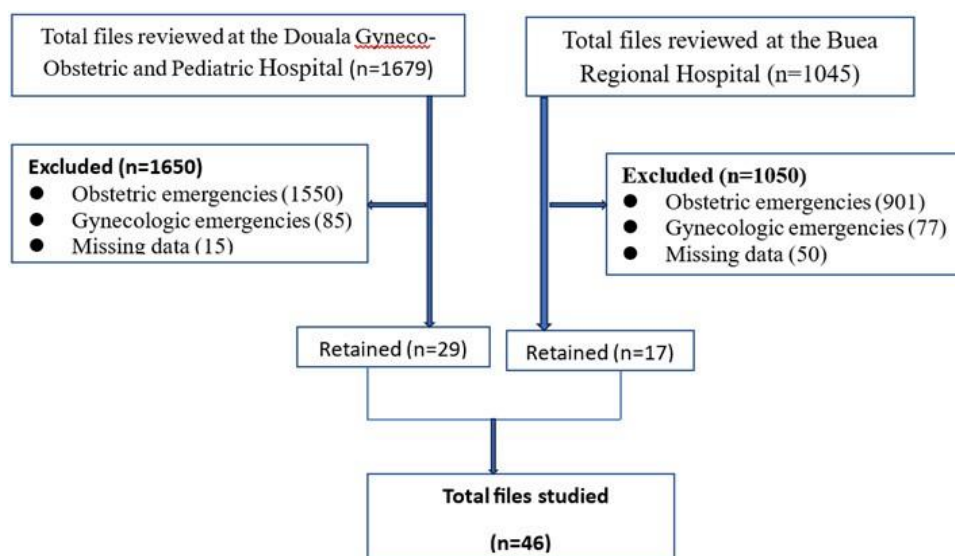
excel sheet was password protected and assessable only to principal investigator. Data were analysed using Statistical Package for Social Sciences (SPSS) version 26.0. Descriptive statistics were presented in frequency tables, graphs, and charts. Continuous variables were expressed as means and standard deviations and categorical variables as counts and percentage.

### 3.6. Ethical Consideration

An ethical approval was obtained from the Institutional Review Board of the Faculty of Health Sciences university of Buea (IRB FHS-UB), followed by an administrative authorization from the Director of the Buea Regional Hospital and Douala Gynaeco-Obstetric and Paediatrics Hospital; The head of the units were then informed about the study and permission was obtained which gave us access to medical records of the patients. Patients' confidentiality was ensured using coded and Serial numbers.

## 4. Results

A total of 2724 files from the surgical departments at the Douala Gyneco-Obstetric and Pediatric Hospital (1679) and Buea Regional Hospital (1045) from which 29 met the inclusion criteria at HGOPED and 17 from BRH. A total of 46 cases of non-obstetric surgical emergency were retained for analysis after excluding 60 files for incomplete data as illustrated on Figure 1.



**Figure 1:** Flow Chart of file acquisition for analysis in HGEOPED Douala.

### 4.1. Proportion of Non-Obstetric Surgical Emergencies During Pregnancy

Non-obstetric surgical emergencies accounted for 1.68% of all surgical emergencies conducted at the two hospitals during the study period. HGOPED recorded a higher proportion 29/1679 (1.72%) cases compared to 17/1045 (1.62%) in the BRH.

#### Socio-demographic characteristics

Out of the 46 cases of non-obstetric surgical emergencies, 47.83% cases were women less than 30 years old. The mean age

of the women who underwent such surgeries was  $30.15 \pm 5.43$  years (range 22 - 41 years 95% CI). More half 58.69% were employed and 52.17% had earned a university degree (Table 1).

#### Obstetric and Surgical Characteristics

The findings revealed that 28 (60.87%) cases were multigravida's women (mean= $2.43 \pm 1.31$ ), 18 (39.13%) cases were Multiparous women (Mean  $1.15 \pm 0.8$ ). Most of the cases (n=27) were in the second trimester (58.69%) as depicted on Table 2.

**Table 1:** Socio-demographic characteristics of the patients.

Characteristics	Frequency	Percentage
<b>Age (years)</b>		
<30	22	47.83
30 - 35	17	36.95
>35	07	15.22
<b>Occupational status</b>	27	58.69
Employed		
Self-employed	11	23.91
Unemployed	08	17.40
<b>Level of education</b>		
Primary school	02	4.34
Secondary school	8	17.40
High school	12	26.09
Tertiary	24	52.17
<b>Marital status</b>		
Married	23	50.0
Unmarried	23	50.0

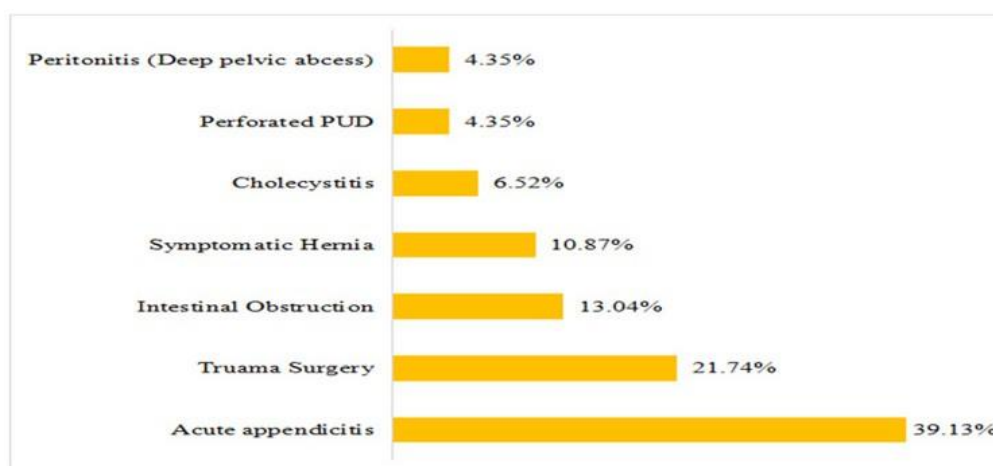
**Table 2:** Obstetric and surgical characteristics of the patients.

Category	Frequency	Percentage
<b>Gravidity</b>		
1	13	28.26
2-4	28	60.87
≥5	5	10.87
<b>Parity</b>		
Zero	13	28.26
1	15	32.61
2-4	18	39.13
<b>Gestational age (weeks)</b>		
<13	4	8.69
13 to 27	27	58.69
28 to 40	15	32.61
<b>Previous surgery</b>		
Yes	06	13.04
No	40	86.96
<b>Indication for previous surgery</b>		
Cesarian section	04	66.67
Blunt abdominal trauma	02	33.33

## 4.2. Indications for Non-Obstetric Surgical Emergency Intervention During Pregnancy

Acute appendicitis (39.13%), trauma surgery (21.74%) and

bowel obstruction (13.04%) were the most common indications for a non-obstetric emergency surgical intervention during pregnancy (Figure 2).

**Figure 2:** Indications for non-obstetric emergency surgical interventions during pregnancy.

## 5. PUD: Peptic Ulcer Disease

### 5.1. Timing Of Non-Obstetric Surgical Intervention In Pregnant Women

Most of the surgical interventions occurred in the second trimester (58.7%). The first trimester had the least number of surgical interventions (8.7%). Most of the surgeries occurred during the

second and third trimester. Acute appendicitis was more common during the second trimester of pregnancy with all cases (n=18) occurring during this period of pregnancy. Whereas, perforated peptic ulcer disease (PUD) were more common during the 3rd trimester (100%). The result found a statistical significance between surgery indication and trimester of pregnancy ( $p < 0.05$ ) as seen on Table 3.



**Table 3:** Indications for Non-Obstetric Surgical emergency according to trimester.

Indications	Total, n (%)	Trimester		
		1 <sup>st</sup> n (%)	2 <sup>nd</sup> n (%)	3 <sup>rd</sup> n (%)
Acute appendicitis	18 (39.13)	00 (0.0)	18(100)	00(0.0)
Truama Surgery	10 (21.74)	4(40.0)	0(0.0)	6(60.0)
Intestinal Obstruction	6(13.04)	0(0.0)	4(66.67)	2(33.3)
Symptomatic Hernia	5(10.87)	0(0.0)	0(0.0)	5(100.0)
Cholecystitis	3(6.52)	0(0.0)	3(100.0)	0(0.0)
Perforated PUD	2(4.35)	0(0.0)	0(0.0)	2(100.0)
Peritonitis (Deep pelvic abscess)	2(4.35)	0(0.0)	2(0.0)	0(0.0)
Total	46(100.0)	4(8.69)	27(58.69)	15(32.61)

## 6. Discussions

This 5-year retrospective study investigated the proportion, types, and trimesters in which non-obstetric surgical emergencies occur in two referral hospitals in Cameroon. The current findings revealed that non-obstetric surgical emergencies accounted for over 1.68% of all emergency surgeries in pregnancy conducted at the two referral hospitals during the study period, with the most frequent surgical pathologies being acute appendicitis, followed by trauma surgery and intestinal obstruction. Most of the surgeries occurred during the second and third trimesters. Acute appendicitis was more come during the second trimester of pregnancy.

Current findings revealed most of the women include in this study were relatively young, with a mean age of 30 years (range 22 - 41 years) which is comparable to the study by [14], whose patients had a mean age of 29.33 years [15]. Also, a similar study by Boukar et al., who reported a mean age 28 years [16]. This study showed that about two-thirds of the women were multi-gravidas. A similar finding reported by Boukar et al. [16], reported that more women who were multi-gravida. Notably, more than half of the participants were had tertiary level of education and employed, highlighting a relatively educated and economically active study population.

### 6.1. Proportion of Non-Obstetric Surgical Emergencies During Pregnancy

Non-obstetric surgical emergencies accounted for 1.68% of all emergency surgeries in pregnancy conducted at the two referral hospitals during the study period. This was in concordance with the findings of Boukar et al. [16] Cameroon and Amine et al, [5]. Who reported that 2% and 1% to 2% respectively of surgeries performed in pregnancy where of non-obstetrics etiology, However this results was slightly higher that obtained by Haataja et al [17], who report 0.2% to 0.7% for non-obstetric surgical emergencies, this slight disparity could be attributed to the difference in study settings and duration, they did a systematic review study of over 22 years and we mainly focused on 5 year hospital base study. Our results are by far lower to what was reported by (25.0%) Ojaghiahghighi et al. in Iran 2018 [18]. This difference can be explained by the difference in study setting we

conducted our study in the surgical and maternity ward whereas most of their participants where from the emergency department they recruited both non-obstetric and obstetrical emergencies in pregnancy.

### 6.2. Indications for Non-Obstetric Surgical Emergency Intervention During Pregnancy

Acute appendicitis (39.13%), Trauma (21.74%) and Bowel obstruction (13.04%) were the most common indications for a non-obstetric emergency surgical intervention during pregnancy, these were similar results obtained in Cameroon [16], Nigeria [19] and Haataja et al. [20] who all reported acute appendicitis to be the most common indication for non-obstetric surgery although their number cases where slightly higher (69.6%) and those in this study this could be explain by the fact that the current study was conducted at two centers and theirs had more centers involved [5], however the results observed in the present study followed similar trends [68] where bowel obstruction and trauma related surgery where the second most common indications of surgery. However, this was different from the study conducted by Boukar et al. [16] and Vujic et al. [15], who had cholecystitis as the second most common cause; this can be explained by the fact that they excluded injury and trauma-related types of surgery. The identification of trauma as a significant cause underlines the importance of injury prevention in pregnant populations in our setting.

The identification of trauma as the second leading indication in this study differs from some literature that reported cholecystitis in that position. This variation may reflect differences in geographic and sociocultural factors, such as road traffic accidents and domestic violence, which may be more prevalent in the study setting. This finding underscores the importance of public health initiatives focused on injury prevention and maternal safety, especially in urban environments. The prominence of bowel obstruction further emphasizes the need for heightened clinical vigilance and rapid diagnostic capacity in managing pregnant women presenting with gastrointestinal symptoms. The implications for practice include improved triage protocols and access to imaging modalities that are safe during pregnancy.

### 6.3. Trimester for These Non-Obstetric Surgical Emergencies

Most of the surgeries occurred during the second with 59% of all cases. Also, 32.61% of the cases occurring in the third trimester and (8.70%) in the third trimester. These findings are clinically relevant because the second trimester is often considered the safest period for non-obstetric surgery due to reduced risks of miscarriage and preterm labor. The timing of emergencies during this trimester may facilitate surgical intervention with relatively lower maternal and fetal risk. Findings concur with previous studies have shown a preponderance of acute abdominal emergencies in pregnancy in the second trimester [5,8,9,21].

Acute appendicitis was more common during the second trimester of pregnancy, with all cases occurring during this period of pregnancy. Whereas, perforated peptic ulcer disease (PUD) was more common during the 3rd trimester. Similar trends were in a study done in Ile-Ife, Southern Nigeria, that reported 70% of patients presenting with acute abdomen in pregnancy to be in the second trimester [22]. However, the findings on the present study differ from those observed by Haataja et al, [20] who reported nearly half of their procedures performed during the first trimester (43%), with (25%) occurring in the second trimester. Interestingly, these findings differ from Boukar et al. [16], who reported the highest number of interventions in the first trimester, potentially due to the inclusion of early obstetric complications such as ectopic pregnancies. The exclusion of such cases in this study allows a more precise analysis of non-obstetric pathologies.

While this study provides valuable insights on the proportion, indications of non-obstetric surgical emergencies and trimester which they occur, several limitations should be acknowledged. The current study is limited by its retrospective design, relying on existing medical records, which introduced risks of incomplete data and potential selection bias. The small sample size limits statistical power and generalizability. Furthermore, the study was confined to two urban hospitals, potentially excluding perspectives from rural settings and missing wider epidemiological patterns. Maternal and fetal outcomes post-surgery were not assessed, representing a significant gap for future research.

This study possesses several strengths. Firstly, it provides one of the few localized analyses of non-obstetric surgical emergencies during pregnancy in Cameroon, filling a critical knowledge gap in sub-Saharan Africa. Secondly, the inclusion of two major referral hospitals adds diversity to the data and enhances the applicability of findings to other urban centers with similar healthcare infrastructure.

### 7. Conclusion

The proportion of non-obstetric surgical emergencies was 1.7%. Acute appendicitis, trauma, and bowel obstruction were the most frequently observed conditions. These emergencies occurred most often during the second trimester. Although uncommon, non-obstetric surgical emergencies represent a critical concern due to their potential risks to maternal and fetal health.

There is urgent need to training of health staffs to facilitate interdisciplinary collaborations between surgical, obstetric, and emergency care teams for timely and coordinated patient management. Trimester-specific clinical protocols should be developed and implemented for common non-obstetric emergencies such as appendicitis, trauma, and bowel obstruction in pregnancy. Strengthen referral systems and emergency transport services to enable prompt surgical care in pregnant women, particularly in remote or underserved areas.

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